River Watch Items for the February 2025 UWP Board Meeting

- River Watch items of interest:
  - February River Watch sampling took place at the six lower UWP sites on February 2nd, 3rd, and 5th.
  - River Watch sent out a notice on January 22nd regarding the processing capacity for metals at the CSU lab. Currently there is only one person (the program manager) processing samples and, based on the number of sites in the River Watch network, they are at capacity and cannot have groups adding sites until at least July 2025. Requests for new sites will be considered after July on a case by case basis. In the January WRWG meeting I mentioned that adding a site downstream of the Ironton restoration project might be useful, so we will see how that request will be received by River Watch.
  - Starting in March the UWP River Corp hire will begin training. Much of her work with UWP will be focused on streamflow measurements at our River Watch sites. We will need to have consistent access to a flow meter, either borrowing one or buying one. I would like to pursue the second option if a reasonably priced one can be found.
- Snowpack, Precipitation and Streamflow:
  - The percentages of median Snow Water Equivalent (SWE) for Colorado basins on February 5th, 2025, are shown in Figure 1. The Gunnison Basin, shown by the blue arrow, had 83% of its median SWE, down from 101% in January. Statewide the northern and central basins (green and yellow shading) had SWE totals of 73 - 99%, while the southern-most basins had SWE totals less than 60%, one as low as 18% (Lower San Juan basin).

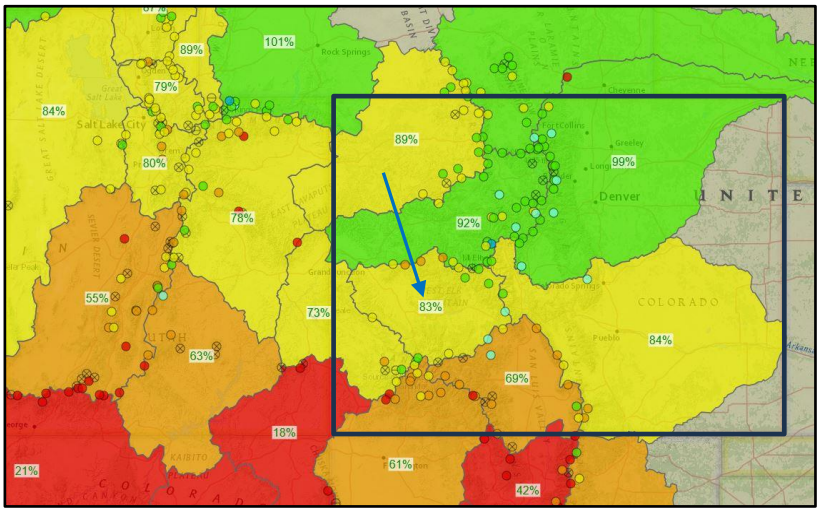

Figure 1. Map of western state river basins (Colorado outlined) showing percentages of median SWE for 5 February 2025.

  - Table 1 indicates that SWE percentages have continued to drop since the beginning of the water year. Idarado and Red Mtn Pass SNOTEL sites declined from >200% in November to 94% and 91%, respectively, on February 5th.

Table 1. SWE totals and percentages of medians for the Gunnison Basin, and Idarado and Red Mtn SNOTEL sites.

Date	Gunnison SWE 15 site avg (in)	Gunnison % of Median	Idarado SWE (in)	Idarado % of Median	Red Mtn SWE (in)	Red Mtn % of Median
11/09/24	2.8	215	1.9	238	5.5	220
12/11/24	5.2	123	3.9	108	8.1	125
01/09/25	7.1	101	5.8	104	10.8	104
02/05/25	8.0	83	7.5	94	12.8	91

  - At midday on February 5th the USGS stream gauge near Ridgway had a flow of 46.1 cfs, slightly above the median of 42 cfs for the date. Flow at the Ridgway site followed the median curve from early December through early January, then dropped to less than median flow for the remainder of January. A few flow peaks greater than 60 cfs occurred during the first week of February, corresponding to a period of unusually warm weather.

- Flow on the Uncompahgre River below Ridgway Reservoir varied between 65 and 74 cfs from early November through most of January, then dropped to the median flow level (~49 cfs) on January 22nd. Since then, flow has been 48-49 cfs.
- On February 5th Ridgway Reservoir storage was 69,630, when the median storage was 64,980 acre-feet. Storage has been relatively steady since late November, with slight increases since late January. Actual storage has been about 5,000 acre-feet above median storage for the past three months.

- River Watch Reporting:

Part of my recent analysis of River Watch data has been an examination of temporal trends in water quality parameters at UWP River Watch sites. The first site to be examined was Potters Ranch on the Uncompahgre River about two miles upstream of Ridgway. Data has been collected at Potters Ranch since 2002. The concentration data for dissolved cadmium (Cd) and total alkalinity are shown in Figures 2 and 3, by sample number, from June 2002 (Sample 1) through December 2023 (Sample 244). Cadmium concentrations showed no

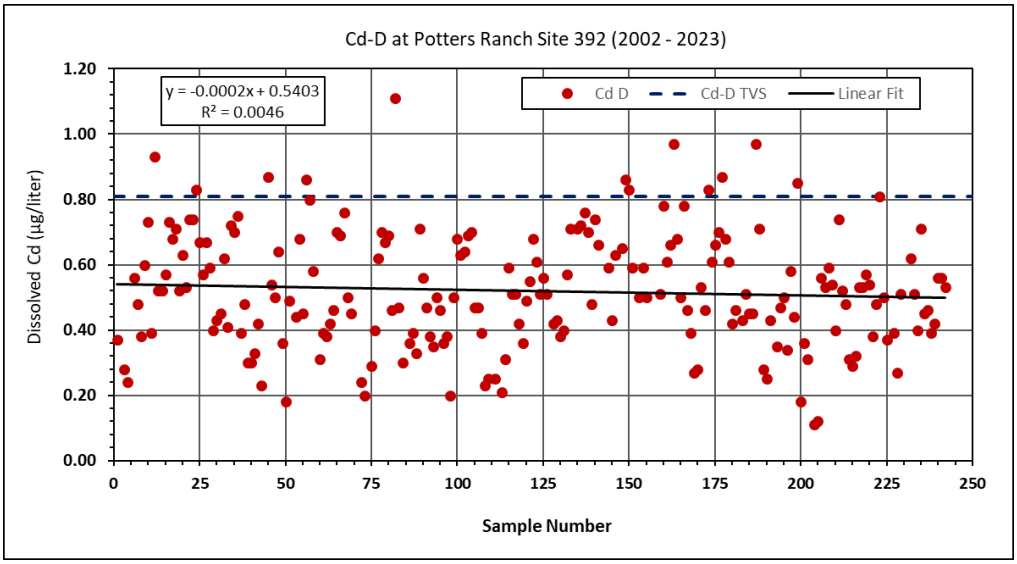

Figure 2. Dissolved Cd concentrations at Potters Ranch from June 2002 through December 2023. Black line is the linear trend line and black dashed line is the aquatic life Table Value Standard for Cd based on the mean hardness of all samples.

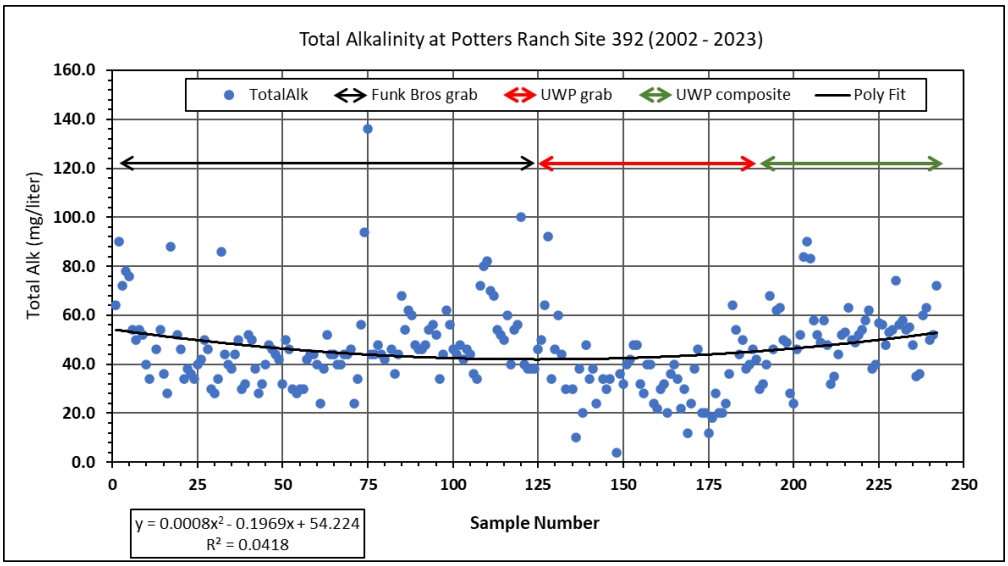

Figure 3. Total alkalinity values at Potters Ranch from June 2002 through December 2023. Black line is a polynomial trend line fit to the data. Colored arrows show the sampling periods for three different River Watch groups.

trend over time, while total alkalinity indicated a weak decreasing, then increasing trend over the same period. Note the R^2 value in Figure 3 is only 0.04, so the trend is not significant. However, in Figure 3 there does appear to be a difference in alkalinity values in time periods sampled by two different UWP River Watch volunteers. In the period sampled between 2013 and 2018 (red arrow) grab samples were collected from the east bank of the river, while from 2019 through 2023 (green arrow) composite samples were collected from the bridge over the river. Most alkalinity values in the earlier period are found below the trend line, while most values in the latter period appear above the trend line.

From prior analyses it has been shown that many water quality parameters have a seasonal variation that is streamflow dependent. To remove some of this seasonal variation the Potters Ranch data set was reduced to data collected between October and March when streamflow is relatively consistent, and low. Figures 4 and 5 show the data for dissolved cadmium and total alkalinity for this low flow period. For cadmium in Figure 4, there is a weak trend indicated by the polynomial fit, where the trend is influenced mostly by the decline in concentrations during the composite sampling period. Total alkalinity in Figure 5 shows an opposite and more significant trend, with values increasing markedly during the composite sampling period. Note the R^2 value increased from 0.04 using all data to 0.22 using only low-flow data.

One explanation for the differences across sampling techniques is that inflow from a spring-fed irrigation ditch into the river from the west bank, about 100 yards upstream of the sampling site, could influence concentrations. This ditch water generally appears quite clear compared to murkier water in the main channel

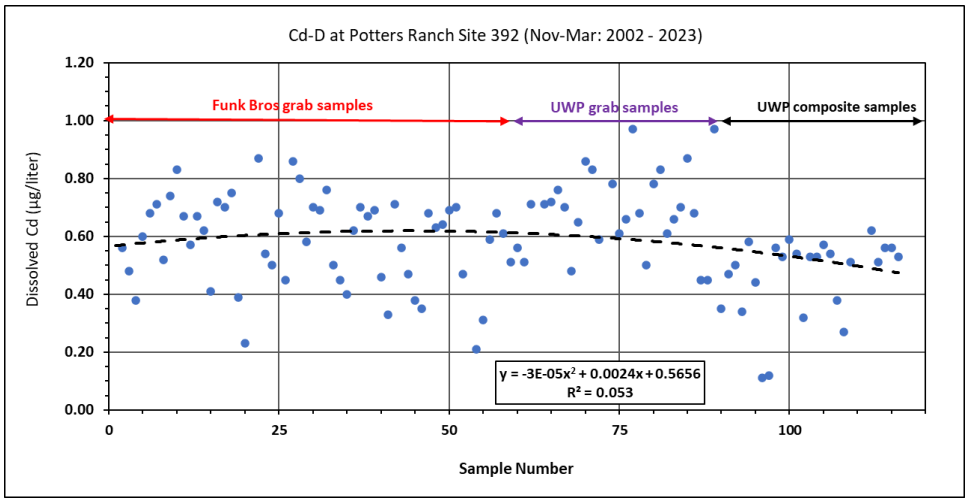

Figure 4. Dissolved cadmium concentrations from 116 samples collected between October and December for years 2002 through 2023. Black dashed line is a polynomial fit to the data, and colored arrows show different sampling periods as in Figure 3.

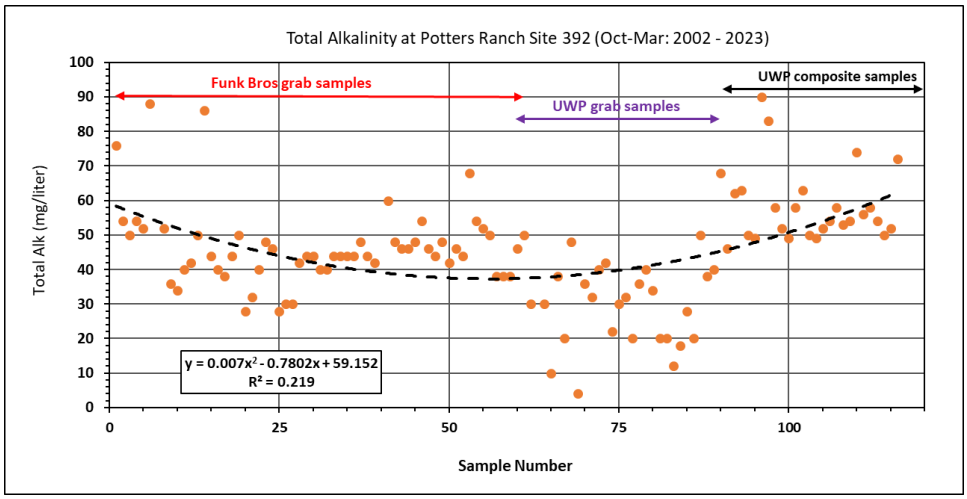

Figure 5. As in Figure 4, except showing total alkalinity values.

of the river and does not completely mix with the main channel for a considerable distance downstream. This water would not have been sampled by grab samples collected from the east bank, while this ditch water has been included in a composite sample taken from the bridge since 2019. The data in Figure 4 suggests cadmium concentrations are lower in the ditch channel and this lowers the overall concentration of cadmium in the composite sample. On the other hand, Figure 5 indicates there is likely a higher concentration of bi-carbonates in the ditch water that increases alkalinity when included in a composite sample.